LOL, what a tangled Web we weave: Strategies for coherence in instant messaging discourse[1,2]

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1. Introduction

Instant messaging (IM), a form of quasi-synchronous communication over the Internet, is a popular medium, with over 69 million reported users in the US, and over 82 million in Europe.[3] Speaking broadly of online discourse genres, IM is most clearly related to Internet chat, in which multiple users send messages in real time to a central location, where they are displayed for all those 'logged in' to see. IM, however, differs in several important ways from the chatroom: IM is generally bilateral, involving no more than two users, while chatrooms can have any number of conversational participants engaged in conversation, and secondly, IM is often conducted between people who are friends or acquaintances in real life, or long-term online contacts, whereas public chatrooms are, generally speaking, anonymous, featuring a transient cast of temporary and infrequent visitors along with chatroom regulars.[4] Section 2 includes a more comprehensive account of the proper characterization of IM.

One of the most striking features of IM is what Herring (1999) calls "interactional incoherence." IM conversations are portrayed as "fragmented, agrammatical, and interactionally disjointed" (Herring 1999: 1), and while this incoherence is the result of multiple factors, two come immediately to the foreground: lack of paralinguistic signals (such as facial expressions, gestures, and intonation), and the quasi-synchronous (rather than truly synchronous) nature of the technology. This conversational incoherence is characterized by overlap of adjacent exchanges and the simultaneous existence of multiple topics in chat discourse (Herring 1999: 3). It should be noted from the outset that the notion of conversational topic is notoriously slippery (Schegloff 1990, Clark

[1] I would like to express my gratitude to Marina Terkourafi for her extensive assistance with the concepts presented here and for her invaluable comments and suggestions on numerous revisions of this paper. I would also like to thank Hans Hock and Rakesh Bhatt for general comments and suggestions on previous versions of this work, as well as Ryan Shosted for suggestions on experimental design.
[2] Research for this project was approved by the University of Illinois at Urbana-Champaign Linguistics Department Institutional Review Board, 04 Apr 2007.
[3] Ars Technica, "60% of IM users prefer MSN Messenger", 11 Apr 2006, http://arstechnica.com/journals/microsoft.ars/2006/4/11/3557 , Accessed 20 Apr 2006
[4] Section 2 includes a more comprehensive account of the proper characterization of IM. For a more in-depth analysis of chatroom ecology, on the other hand, see Paolillo's (2001) social network treatment.

1996). For this reason, in Section 2, I will progress from the notion of topic to the concept of the adjacency pair (Schegloff 1990), which more firmly captures textual coherence in IM, displaying the unique characteristics of this genre.

This paper is concerned primarily with whether IM users have certain strategies for maintaining comprehensibility when the exchange becomes incoherent. I propose that frequent users of IM technology will have a greater range of strategies to choose from, as well as a better command of these strategies. My analysis will explore the specific genre of instant messaging in-depth in order to capture these strategies. Through an adjacency pair-based analysis of data collected from ten 20-minute IM conversations between interlocutors of varying experience with the IM medium as well as varying levels of interpersonal familiarity, this study will evaluate claims regarding the conversational coherence of IM, identify and evaluate strategies for reducing incoherence (or bypassing it altogether), and discover the effects of IM experience and interpersonal familiarity on the organization of this medium.

2. Previous work

In looking at the previous literature on computer-mediated communication (CMC) as it applies to instant messaging, there are several main considerations. In order to make any generalizations meaningful, it is first necessary to characterize IM in specific detail as a genre of CMC. In addition, upon completing an overview of literature regarding topic, I will discuss the (often problematic) notion of topic within the more general literature on conversation analysis, and discuss the alternative used in this study.

2a. *Netspeak?*

The most influential line of thought in the 1990s is what Androutsopoulos (2006) calls a 'first wave' of scholarship regarding CMC and its specific features. David Crystal's (2000) book, *Language and the Internet*, sets forth the most common 'first wave' argument: because there are certain technological restrictions to language use online, it should be treated as a "new variety" of language, one which falls in between the registers

of speech and writing. This way of thinking about CMC, however, soon lost currency, as more and more CMC researchers realized that language on the Internet constituted not one unified variety, but a plethora of genres and subgenres, each with its own features. It remains fairly obvious that it is impossible to investigate, say, certain features of language which are prominent in the writing of online personal journals, and then generalize those findings to the language of chatrooms.[5] Despite a lack of face-to-face communication and several other common factors, these two genres are disparate enough to warrant separate analyses.

2b. *Toward a faceted classification of IM as a CMC genre*

Is it, then, impossible to say anything meaningful about language use on the internet? Only if you're talking about all language use on the Internet at once—I consider this sort of endeavor to be like studying language in newspapers, on classroom chalkboards, on billboards, and on the bathroom wall, all at the same time. To avoid this sort of pitfall, Herring (2007) proposes a faceted classification system for CMC, which allows for characterization of a particular genre of CMC in accordance with its particular attributes.

The concept of facets, which originally comes from the field of information science, is applied to CMC in two overarching categories, called "types of influence". *Medium* factors are factors which arise from the technological limitations or settings. Herring (2007: 13) divides this category into ten facets:

M1. Synchronicity
M2. Single-vs-dual message transmission
M3. Persistence of transcript
M4. Size of message buffer
M5. Channels of communication
M6. Anonymous messaging
M7. Private messaging
M8. Filtering
M9. Quoting
M10. Message format

It is important here to note that each facet, or factor (the terms are used more or less interchangeably by Herring), will be set to a particular value when applied to a CMC

[5] For further discussion of the 'Netspeak myth', see Androutsopoulos (2006).

genre. The possible range of values can be binary, as in Anonymous messaging, where the possible values are 'yes' and 'no' (or 'available' and 'unavailable'); or gradient, as in Size of message buffer (ranging from 1 character to theoretically infinite values). The scheme is open-ended, meaning that additional facets can be added if deemed necessary, which allows for a great deal of flexibility. In addition to these medium factors, Herring proposes a set of s*ituation* factors, which are features arising from social realities. These include (Herring 2007: 18-19):

S1. Participation structure
    [One-to-one, one-to-many, many-to-many]
    [Public/private]
    [Degree of anonymity/pseudonymity]
    [Group size; number of active participants]
    [Amount, rate, and balance of participation]
S2. Participant characteristics
    [Demographics: gender, age, occupation, etc.]
    [Proficiency: with language/computers/CMC]
    [Experience: with addressee/group/topic]
    [Role/status: in 'real life'; of online personae]
    [Pre-existing sociocultural knowledge and interactional norms]
    [Attitudes, beliefs, ideologies, and motivations]
S3. Purpose
    [Of group, e.g., professional, social, fantasy/role-playing, aesthetic, experimental]
    [Goal of interaction, e.g., get information, negotiate consensus, develop professional/social relationships, impress/entertain others, have fun]
S4. Topic or theme
    [Of group, e.g., politics, linguistics, feminism, soap operas, sex, science fiction, South Asian culture, medieval times, pub]
    [Of exchanges, e.g., the war in Iraq, pro-drop languages, the project budget, gay sex, vacation plans, personal information about participants, meta-discourse about CMC]
S5. Tone
    [Serious/playful]
    [Formal/casual]
    [Contentious/friendly]
    [Cooperative/sarcastic, etc.]
S6. Activity
    [E.g., debate, job announcement, information exchange, phatic exchange, problem solving, exchange of insults, joking exchange, game, theatrical performance, flirtation, virtual sex]
S7. Norms
    [Of organization]

[Of social appropriateness]
[Of language]

S8. Code

[Language, language variety]
[Font/writing system]

These social facets, while necessarily more complex than the medium facets, provide an extremely rich classification of the genre of IM (and specific instances of IM usage). It is, however, possible that these social facets, unlike the medium facets, may not be easily delineated—some, like S7: Norms [of language], would necessarily rely heavily on the values of S2: Participant characteristics. It is important to consider these social facets as merely indicative of general aspects of the discourse. While they cannot provide an exhaustive definition, the faceted scheme nevertheless remains useful for description, and the open-ended nature of the scheme allows this description to be as specific as is necessary for the current analysis.

2c. *Turn-taking and topic-tracking in CMC*

Herring (1999) discusses the phenomenon of topic transition and turn-taking within the context of interactional incoherence, which involves "processes of turn-taking and topic maintenance [being] subject to disruption and breakdown" (1999:1). Herring attributes this incoherence to two primary factors (1999:2):

> 1) lack of simultaneous *feedback*, caused by reduced audiovisual cues and the fact that messages cannot overlap;
> 2) disrupted turn *adjacency,* caused by the fact that messages are posted in the order received by the system, without regard for what they are responding to.

Herring further notes that:

> ...spoken conversation, especially dyadic interaction, exhibits a high degree of turn adjacency; that is, relevant responses tend to occur temporally adjacent to initiating turns. [...] Such "adjacency pairs" (and adjacency sequences) structure conversation and facilitate referential coherence. Conversely, when adjacency is disrupted, users may experience difficulty in tracking sequential exchanges, and interaction may become fragmented as a result. (1999:2)

Herring surveys a number of CMC studies in order to determine whether CMC is indeed interactionally incoherent, why it is interactionally incoherent, and how users adapt to this. Considering an example of chatroom conversation involving two conversations with two conversants each, occurring simultaneously, Herring introduces the concept of overlapping exchanges (1999:3), which is key to the present study.

One problematic point with Herring's analysis involves the definition of 'exchange' used in her discussion of exchange overlap (1999:3): "'Exchanges' here refer to different sub-topics of discussion within a larger topic." In a discussion of sequential coherence, however, she writes:

> Thus on the local level we find minimal units of conversational structure known as "adjacency pairs" [...] or "exchanges" [...], depending on whether such minimal units are thought to consist of two or three turns. On the global level, extended sequences of related turns comprise "topics" or "discourse topics." (1999:5)

Relying on the notion of topic when addressing the organization of conversation is problematic for several reasons discussed in Section 2d. While Herring mentions the notion of adjacency pair, she considers this only briefly before moving toward a topic-based approach to incoherence.

With regard to strategies used to counteract the effects of incoherence, Herring's survey reveals a number of adaptive turn-taking strategies in use:

- A frequent use of backchanneling (short utterances like 'yeah' or 'uh-huh' in a social MUD, or Multi-User Dungeon, a type of online game.
- Quoting, on an e-mail listserv (a type of asynchronous CMC).
- The use of '%' at the end of a line by certain users in an Internet Relay Chat channel to indicate the user's intent to continue to hold the floor.
- Raising of hands, on a MUD where emotes (ersatz actions or gestures) are available.
- Increasing turn overlap, on a VAX 'phone' system, where communication is two-way (characters are displayed to both users as they type); this is posited to make turn-taking more efficient than even speech, due to the text record left behind.
- Prefacing utterances with the name/nickname of the intended recipient, on multi-party chat systems.

- "Linking", or beginning a response by paraphrasing the content of a previous message, on an e-mail group discussion list.
- Agreement on a discussion topic in advance, on asynchronous group forms of CMC.
- Moderation (here in the sense of removing off-topic contributions or reminding users to stay on-topic), on asynchronous group forms of CMC.

These are not all applicable to IM (e.g. moderation or agreement on a discussion topic), but one might expect to find backchanneling or a means of holding the conversational floor. Regardless, this list of strategies supports the idea that users of CMC do use compensatory strategies to offset the effects of constraints imposed by the medium.

On IM and its relation to topic, Herring mentions that "threads", which are sequences of exchanges on a particular topic, are difficult to maintain, and because of the cognitive challenge of tracking multiple exchanges, "topics decay quickly in computer-mediated discussions, hastened along by off-topic digressions and tangential observations which move the discussion away from its original focus." This study, in part, attempts to evaluate particularly this kind of claim, especially because, as Herring notes, "empirical research on topic decay (in any communicative modality) is limited" (1999:6).

After defining incoherence in terms of topic decay and disrupted turn adjacency, Herring concludes that while CMC is often incoherent, its users employ numerous strategies to offset this incoherence, and additionally exploit instances of incoherence for playful exchanges. In the present study, I continue this line of research in the specific CMC genre of IM by evaluating the relationship between coherence and comprehensibility, thereby identifying strategies for coherence applicable to IM.

2d. *(Re)defining topic: the concepts of sequence and adjacency pair*

Topic is a central notion to Herring's (1999) analysis, as discussed above. However, topic is a problematic notion for studies involving coherence because it is exceedingly difficult to define consistently. This problem, and a possible solution, are set forth in Schegloff (1990). Schegloff begins by listing five problems with topic as a concept used in accounts of coherence: the problem of topic determination, stepwise shifts in topic

which allow coherence despite topic changes, the difficulty of discretely characterizing a topic, the complexity of topic identification by a third party, and the pitfall of treating talk as 'talk-about' rather than 'talk-that-does' (1990:51-52). He then proposes adopting the notion of structuring in terms of sequences and adjacency pairs in accounts of topic. This circumvents many (but not all) of the above problems.

An adjacency pair involves two parts, which are produced by different speakers and ordered as a first and second part. These are typed—a first pair part can constitute an offer, a request, a greeting, and so forth, and a second pair part constitutes an appropriate response to the previous turn. The primary adjacency pair discussed in Schegloff (1990:56-58) is comprised of a request and an acceptance:

(1) 009 *B:* hhh 'n I was wondering if you'd let me borrow your gun.
[...]
090 *J:* [Y] eah:, you can use't

While the point is not explicitly made, it seems that Schegloff takes a sequence of talk to minimally constitute a completed adjacency pair. In addition, a sequence can include inserted sub-sequences made up of adjacency pairs which can serve the function of disambiguating the first pair part or gathering additional information for selection of an appropriate second pair part. The two parts of the adjacency pair above, for example, are separated by multiple insertion sequences. As a final addition to the sequence-adjacency pair framework, relevant material can be pre-inserted, that is, occur before the first pair part. The example in (1) is prefaced by a pre-request (Schegloff 1990:56):

(2) 001 *B:* But- (1.0) Would<u>ju</u> do me a favor? heheh

A schematic account of how longer sequences may be built up from adjacency pairs is given in Levinson (1983:306), who notes that while the organization of adjacency pairs constitutes a local system (2 turns), this organization "can by means of the accumulation of first pair parts project a large sequence of expectable seconds", yielding the following structure:

(Q1(Q2(Q3(Q4-A4)A3)A2)A1)

This structure (or variations on it) would be expected for any extended sequence under Schegloff's (1990) system. The claims I make in the concluding section of this study regarding the unique properties of instant messaging discourse rely crucially on the understanding of this nested structure as typical of spoken conversation.

The sequence, comprised of a main adjacency pair as well as additional sub-sequences inserted before or in the middle of the pair, forms the basic machinery for Schegloff's account of coherence. On coherence itself, Schegloff notes:

> Coherence should be findable for everything that is a demonstrably relevant aspect of the talk for the parties, or there should be evidence of trouble or of its suppression. (1990:55)

The notion of sequence based on the notion of adjacency pair, then, seems well-motivated as an alternative to topic for discussions of coherence, given the difficulty of identifying and characterizing topic. By its more exact definition alone, the notion of sequence is more methodologically sound for use with experimentally-collected texts.

The above framework does dispel many of the obstacles posed by the notion of topic, but it is not without its own flaws. An important point is that the definition of an adjacency pair involves an identification of the first pair part's type and the identification of an appropriate second pair part. Schegloff (1968:1083) offers:

> By conditional relevance of one item on another we mean: given the first, the second is expectable; upon its occurrence it can be seen to be a second item to the first; upon its nonoccurrence it can be seen to be officially absent—all this provided by the occurrence of the first item.

Determining this conditional relevance obviously must rely on the proper identification of the first pair part's type, so the relevant question in this case is whether the typing of the first pair part is a foolproof process. When the type of the first pair part is ambiguous or not immediately obvious, a third-party annotator might assign it a type based on its response, which at least indicates what kind of first pair part the addressee understood it as. Without recourse to additional information, this is one of the only means of determination available: the problem is that this circularly defines the relevance of the

second pair part. There is one other option for the annotator unsure of what a first pair part's purpose is, and this involves a recourse to what it regards. This option nullifies Schegloff's (1990) reason for a shift to adjacency pair: "talk-that-does" being a more productive notion than "talk-about", and becomes a resort to the general understanding of topic. However, it is important to consider the following points: the identification of topic draws information only from compositional semantics, whereas the identification of an adjacency pair draws information both from the compositional semantics of its contents and from knowledge of what type of exchanges are expected, i.e. from canonical exchanges for a certain context. The fact that identification of the adjacency pair draws on two sources of information justifies the adjacency pair as a more empirically robust alternative to topic, and for this reason, I adopt the adjacency pair as a basic organizational unit of conversation.

A development of Schegloff's sequence-adjacency pair framework is found in Clark's (1996) discussion of joint projects. Clark's joint project is roughly equivalent to (my understanding) of Schegloff's sequence: it minimally consists of a complete adjacency pair, and can involve additional sub-projects before or within it. In addition, Clark's discussion clears up several points regarding the adjacency pair: A second pair part often serves as a first pair part for the next project, thereby chaining joint projects/sequences. Clark also succinctly problematizes the notion of topic:

> The notion of topic is notoriously vague, with little consensus on how it is to be defined and applied. ... Essays and speeches can be divided into topics, then, because they are (1) highly planned, (2) under unilateral control, and (3) comprised mostly of assertions. Conversations, in contrast, are (1) opportunistic, (2) under joint control, and (3) comprised of much more than assertions. (1996:341-2)

Clark's conclusion is that the concept of joint project is far more useful for treating dynamic interactions like conversation. Additionally, Clark introduces a scheme for classifying transitions between projects in extended conversation. Taking *s* to be an extended joint project, and *t* to be the next extended joint project, Clark identifies five types of transition (1996:343):

	Description	Relation of *t* to *s*
Next	Enter next project	*t* is subsequent to *s*
Push	Enter subproject	*t* is part of *s*
Pop	Return from subproject	*s* is part of *t*
Digress	Enter digression	*t* is a digression from *s*
Return	Return from digression	*s* is a digression from *t*

In the above schema, it is important to distinguish between the Push-Pop dynamic and the Digress-Return dynamic. To accomplish this, one can appeal to Schegloff's (1968) notion of conditional relevance as further developed in Clark and Schaefer (1989:272): not only does a first pair part anticipate an expectable and relevant second pair part, but the production of a second pair part can also exploit the notion of conditional relevance. In the Push-Pop dynamic, assuming A produces a first pair part, and B a second pair part,

> once it is on record, it is relevant and expectable that A will proceed to the use he wants to make of that information. That is, after the second part of an adjacency pair, it is conditionally relevant immediately to initiate the next contribution at the same level as those two parts. (Clark and Schaefer 1989:272)

On the other hand, a subsequent first pair part which does not meet these conditions would necessarily be treated as a digression. Clark's (1996) scheme thus appropriately captures the relations between projects and subprojects. While I do not adopt the terminology given here, an understanding of how this system works is key for capturing the distinction between subprojects and side projects which are unrelated to the primary project.

3. The Data

3a. *Experimental Considerations*

The data used in this study consist of ten 20-minute IM transcripts involving sixteen participants (four participants were used twice). The subjects were undergraduate students, graduate students, and professors at UIUC. Five participants were male, and eleven were female. The ages ranged from 18-35. The participants' demographic data were collected by means of a one-page survey.

Two independent variables were manipulated. The first, IM experience, was taken to vary on a three-point scale: participants were placed into the categories of Novice (NOV), Intermediate (INT), and Expert (EXP) based on frequency of use and length of IM experience.

The participants self-reported each of these factors, which translate to categories as follows:

	Daily	Weekly	Monthly	Yearly	Never
NOV	N/A	<1 year	<3 years	always NOV	always NOV
INT	<1 year	1-8 years	4+ years	N/A	N/A
EXP	1+ years	9+ years	N/A	N/A	N/A

This table is based on estimates—roughly speaking, it classifies those likely to have used IM less than 50 times as NOV, those likely to have used it 500 or more times as EXP, and those in-between as INT. Because most IM users (especially those who use it more frequently) have no way of knowing the exact number of times they have used IM, this approximation is necessary.

The second variable, familiarity with conversational partner, refers specifically to familiarity in real life, though this is not exclusive of online familiarity—some expert-level participants frequently conversed with their partners over IM. This was again determined by participants' self-reporting, and varied between two values:

A) Close Friends/Frequent conversants

B) Acquaintances/Never met.

In one instance, the conversational partners disagreed in their surveys. Because unanimity is taken to be a necessary prerequisite for membership in category A, this conversation was placed in category B.

The aim of the project was to collect one conversation in every combination of the IM experience variable (NOV/NOV, NOV/INT, NOV/EXP, INT/INT, INT/EXP, and EXP/EXP) in each familiarity category. However, given the constraints of the project (participation was voluntary, no compensation was offered), in the end all but two

combinations of variables were collected: no subjects meeting the conditions INT-INT A and NOV-INT B were available. All subjects agreed to have their IM data collected.

3b. *Technical Considerations*

The IM software used was Trillian Basic 3 by Cerulean Studios.[6] Trillian is a free multi-platform instant messaging client which works with accounts on several major IM protocols and automatically collects log-files of IM sessions, including time-stamps, if configured to do so. Another benefit to using this program was that it could be installed directly onto a USB flash memory drive, and would run off of this regardless of administrative restrictions on individual computers.

Instant messaging protocols are specifications for how messages are sent or received, and indicate which servers the messages are routed through, maximum size of messages, the other channels which can be used, and so forth. Most major IM protocols are proprietary. The AOL Instant Messenger (AIM) IM protocol was used, owing to its popularity for instant messaging. Accounts were registered using AIM's online registration tool, with screennames being a combination of two words (such as AlarmRequest or CrossroadRacing) from a random word generator[7]. Each participant was allocated one of these screen names.

3c. *Collection Procedure*

Two participants at a time met in person at a specified location, and were introduced, if necessary. The participants were placed in front of computers in different rooms, far enough distant that all but the loudest screaming would be inaudible from one to the other. This separation was necessary to ensure a complete unavailabilty of paralinguistic gesture, audible laughter, facial expressions, etc. thereby faithfully re-creating online circumstances. The participants were asked to chat with each other using the IM software for a 20-minute span. No topic was given, as this would interfere with the purpose of the experiment. After each session, the USB flash memory drive containing

[6] http://www.ceruleanstudios.com
[7] http://watchout4snakes.com/creativitytools/RandomWord/RandomWordPlus.aspx

the automatically-saved chat logs was collected. I was occasionally present in one of the rooms, but usually read or used another computer for unrelated purposes, and I was not in a position to see the participants' screens.

4. Analysis

4a. *Faceted Analysis*

Let us first turn to the faceted scheme for classification proposed by Herring (2007). This part of the analysis will identify the particular CMC situation discussed here in rich terms[8], focusing on those factors whose values might have some effect on the data (for the full listing, see section 2b).

Medium Factors

M1. Synchronicity: Quasi-synchronous
M2. Single-vs-dual message transmission: Single
M3. Persistence of transcript: Semi-permanent (through session)
M4. Size of message buffer: 7950 characters max.
M5. Channels of communication: Text only
M6. Anonymous messaging: Possible, but not in this instance.
M7. Private messaging: Private messaging only
M8. Filtering: No
M9. Quoting: Possible
M10. Message format: Newest lowest, previous messages scroll upwards, Screenname/date/timestamps on each message

Situation Factors

S1. Participation structure : One-to-one, private, no anonymity (in this particular IM situation), Group size 2, 2 active participants, roughly half-and-half balance of participation.
S2. Participant characteristics
[Demographics: Male/female, 18-35, academic]
[Experience: Novice, Intermediate, or Expert CMC proficiency]
[Familiarity: Acquaintaince/friend of interlocutor]
[Role/status: Same as in real life]
S4. Topic or Theme
[Of exchanges: variable/free]

[8] For a more thorough explanation of any of these facets, see Herring (2007).

S6. Activity
[Information exchange, phatic exchange and so forth. Varies depending on participants (none enforced)]
S7. Norms
[Of organization: University Code of Conduct for internet usage.]
[Of social appropriateness: Those between students generally in academia. Certainly varies in these data.]
S8. Code
[English, Standard American English]

Aside from a few minor deviations here or there to account for the specific circumstances of this project, these (especially the Medium factors) would support generalizability to other IM situations.

4b. *Interlude: a note on conventions and terminology*

In general, I will use the term 'contribution' to refer to a single message submitted to the chat window. An important note is that multiple contributions may jointly constitute a single turn in the traditional CA sense. Nonetheless, for ease of analysis, and without losing too much in doing so, I will take the contribution as defined above to be the basic unit of IM organization. For the textual analysis in this study, I adopt a modified version of the conversation-analytic framework of Schegloff (1990) and Clark (1996), using the basic notion of adjacency pair as referring to two contributions made by different conversational participants which are ordered and typed. While my analysis will not identify types of adjacency pair parts, establishing that a relationship between pair parts exists is key. To this end, I will subsume Schegloff's 'sequences' under Clark's term 'joint projects'. It is important to keep in mind the relationship between the adjacency pair and the joint project: in figure 1, below, contributions A1 and A2 form an adjacency pair (indicated with a solid bracket), but A2+ is additional information added to A2, and is included as part of project A. The first pair part of project B (B1) intervenes as well, and is resolved later in the text.

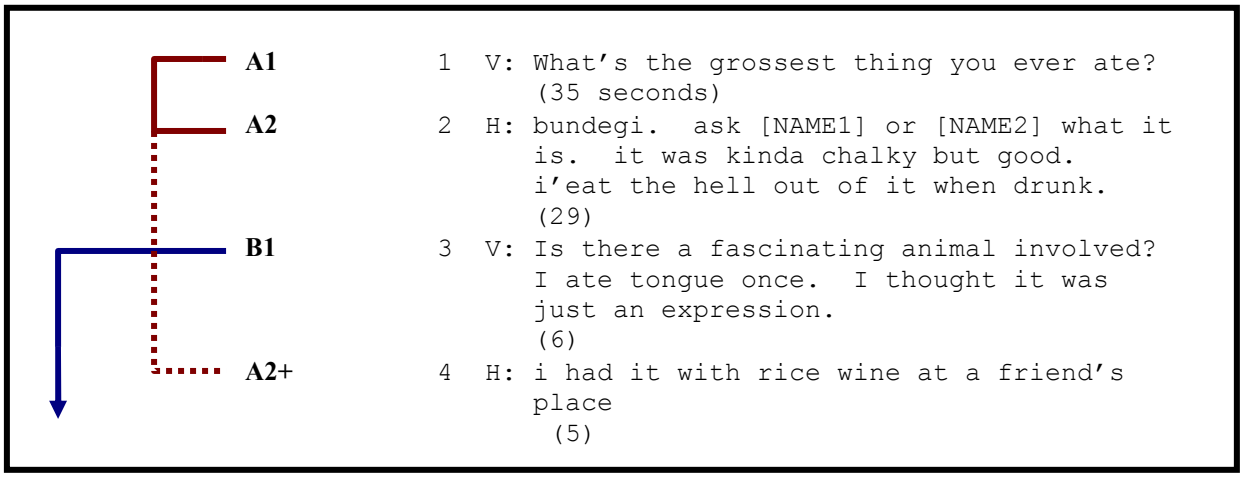

Figure 1. An excerpt from the NOV-NOV A conversation displaying a turn divided into multiple contributions (A2) and (A2+)

I will furthermore define a subproject as a joint project started within the adjacency pair of another project which is relevant to the larger joint project. Subprojects are relevant in that they generally serve to clarify or disambiguate a prior first pair part. Projects which occur within another project and are not conditionally relevant to the joint project under consideration (as per Clark's Digress-Return dynamic) will be considered distinct joint projects. A continuation of a first or second pair part (e.g. A2+ in Fig.1, line 4) will be referred to as an increment, and a contribution anticipating a first or second pair part will be referred to as a pre-increment. The annotation scheme used is laid out in detail in the next section. While this annotation scheme is not as rich as many standard conversation-analytic practices, it suffices for the purpose of discovering basic textual organization, and can be considered a 'streamlined' version which supports more rapid annotation of larger texts.

4c. *Textual analysis*

The chat logs were examined and annotated, identifying joint projects, subprojects, and adjacency pairs. The text is annotated as follows:

1) Joint projects: capital letters (A, B, C, ...)
2) Subprojects: lowercase letters (Cd is the fourth subproject within joint project C)
3) Subsubprojects: subscripted letters (Cd_b is the second subsubproject within the fourth subproject within joint project C)
4) Adjacency pairs:

a. First pair part identified by 1 appended to project label (A1, B1, Db1, ...)
b. Second pair part identified by 2 appended to project label (A2, B2, Db2, ...)

5) Increments, or continuations: Plus (+) symbol. Increments are continuations of a first or second pair part. (B2+ is additional information added to the second pair part of joint project B)
6) Pre-increments[9]: Ampersand (&) symbol. This term refers to contributions which occur before a first or second pair part which 'anticipate' the main pair part. One of the more common types in the data serves a discourse placeholding function--indicating the speaker's future intent to produce a first pair part. (A1& is a pre-increment which occurs before the first pair part of joint project A)
7) Dual-role pair parts: Equal (=) symbol. These are pair parts which serve as both second pair part of the preceding first pair part and first pair part of the following second pair part, thereby chaining projects together. (A2=B1 is both the second pair part of joint project A and the first pair part of joint project B.)

Increments and pre-increments as defined in 5) and 6) above can be thought of as byproducts of the definition of contribution: several contributions can occur within a single turn, and increments and pre-increments represent a user's decision to break a turn up over several contributions. The annotation of increments and pre-increments is justified: figures 1 and 2 contain instances where increments and pre-increments belonging to a joint project are separated from the adjacency pair of that project. Figure 2 below presents an example of an annotated excerpt.

[9] Some of the above terms and definitions could also be captured within Blum-Kulka, House, and Kasper's (1989) Cross-Cultural Speech Act Realization Project (CCSARP). However, as their entire battery of definitions is not needed for current purposes, and for consistency with the CA-oriented terminology used in the rest of this essay, I opt for a notational system that is immediately accessible (i.e. without requiring knowledge of a separate, speech-act theoretic scheme) and streamlined to capture the most basic structural information,.

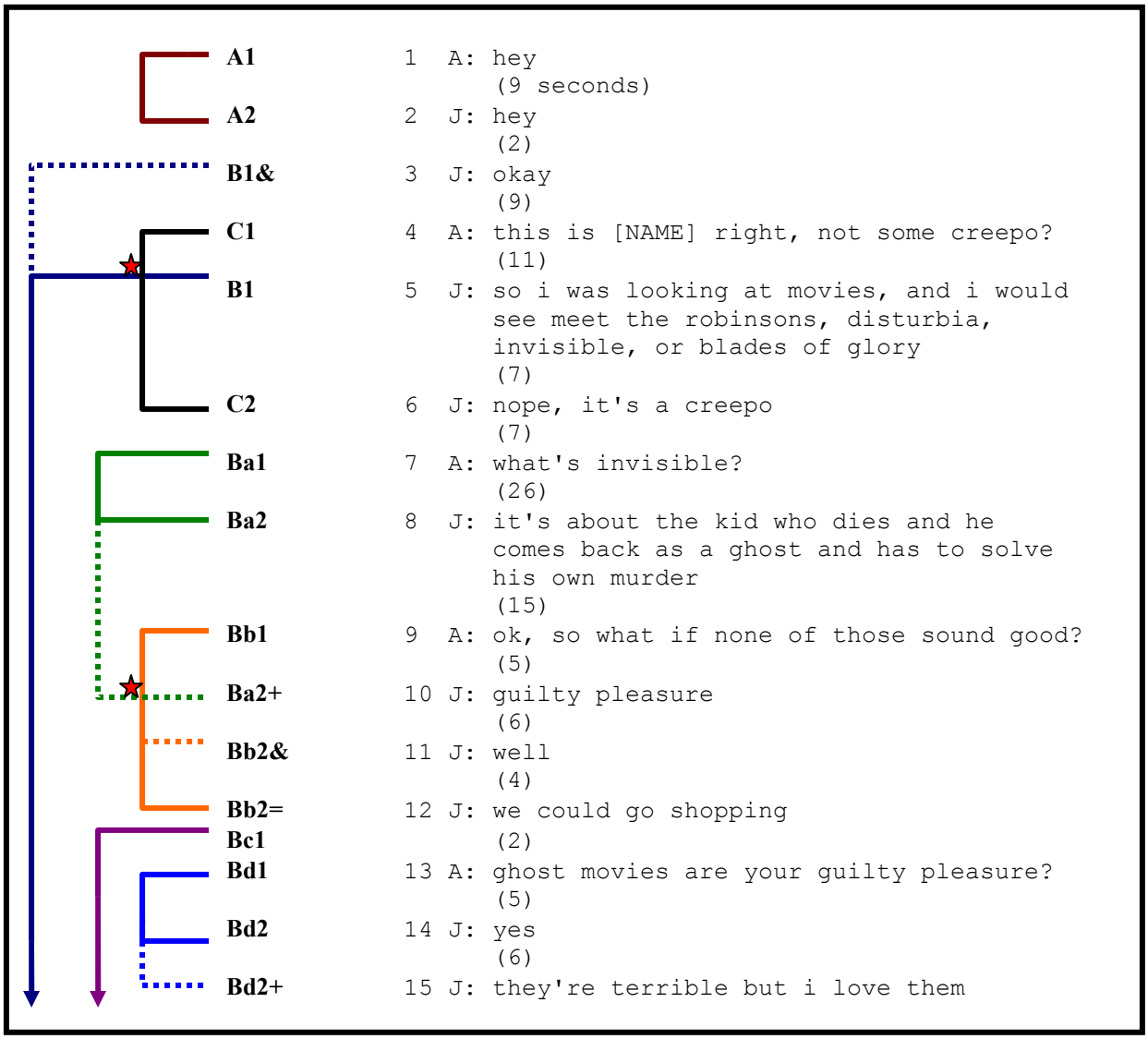

Figure 2. An example of the annotation scheme in action: Solid brackets identify adjacency pairs and dotted lines connect increments and pre-increments to their joint projects.

The sample annotation in figure 2 contains, at lines 5 and 10, two instances of project overlap (indicated with small stars). When two adjacency pairs (or their attendant additional material) 'tangle' such that one pair is not completely contained within the first and second pair parts of another pair, this creates project overlap. I will tentatively posit that these overlaps identify instances of conversational incoherence. Recall Levinson's nested adjacency pairs—that neatly nested structure is simply not happening in these cases.

It would be exceedingly strange to see the text from lines 4-7 or 9-12 sequentially in a transcription of a spoken conversation. It is precisely the quasi-synchronous nature of IM which leads to such problems: because one party is typing a message without an indication of what the other party is doing, two unrelated first pair parts may be submitted near-simultaneously, causing an inadvertent digression in the sense of Clark (1996) discussed earlier. I use two methods of discovering and evaluating strategies used to maintain coherence when project overlaps occur: quantitative, which involves looking at the occurrence of certain aspects of the textual structure, and qualitative, which involves identifying those strategies that overtly present themselves in conversation.

After annotation, the incidence of several structural phenomena was tallied. For the quantitative approach, the following data were collected for each text: the length of the conversation in minutes and seconds, the total number of words, the total number of contributions, the number of joint projects initiated and completed, the number of increments and pre-increments, the number of dual-role pair parts (used to chain joint projects together), and the number of overlaps. For the qualitative approach, obvious instances where confusion arose as a result of project overlap and overt strategies used to resolve these were noted in the text. For each instance, I describe the strategy in question or account for the confusion. Several of these excerpts are discussed following the quantitative analysis.

5. Results

5a. *Quantitative analysis*

The following results are presented in table format, representing the ten texts collected in terms of the two variables. As table 1 shows, conversations ranged between 19 minutes: 4 seconds and 20 minutes:10 seconds in length.

	Familiar	Unfamiliar
NOV-NOV	20:02	20:06
NOV-INT	20:02	--
NOV-EXP	20:01	19:04
INT-INT	--	20:10

INT-EXP	20:07	20:02
EXP-EXP	20:09	20:02

Table 1. Length of conversation (minutes:seconds)

The amount of text collected is relevant in order to have a meaningful comparison of number of joint projects. Table 2 presents the number of contributions in each conversation. Overall, two trends are evident: more contributions were made in higher-familiarity conversations than in lower-familiarity conversations, and in general, a higher level of experience with IM correlates with an increase in contributions. However, it must be noted that this trend is disrupted in both conditions of familiarity by a spike in contributions in the INT-EXP condition and a subsequent drop in the EXP-EXP conditions, an anomaly for which I have no concrete explanation.

	Familiar	Unfamiliar
NOV-NOV	99	62
NOV-INT	125	--
NOV-EXP	151	133
INT-INT	--	136
INT-EXP	210	164
EXP-EXP	173	135

Table 2. Number of contributions per conversation

The comparison of the number of joint projects initiated vs. completed in each text indicates how often first pair parts were not completed—recall Herring's (1999) claim regarding the rapid decay of topics in CMC, which can be recast as a generalization regarding joint projects. As Table 3 indicates, there do not seem to be significant patterns here with regard to the variables, but it is interesting that the conversation between unfamiliar novices left no joint project incomplete. This combines with the low number of contributions in this conversation to suggest a great deal of caution and careful monitoring of conversational structure on the novices' part.

	Familiar	Unfamiliar
NOV-NOV	58/47 (19%)	35/35 (0%)
NOV-INT	60/55 (9%)	--
NOV-EXP	78/59 (24%)	58/50 (14%)
INT-INT	--	62/59 (5%)
INT-EXP	84/72 (14%)	72/67 (7%)
EXP-EXP	78/74 (5%)	63/56 (11%)

Table 3. Number of joint projects initiated/completed (percent not completed)

Overlaps are a key element to Herring's (1999) notion of incoherence. The incidence of overlaps in the texts in table 4 shows, surprisingly, that overlaps seem to be occurring for experts with roughly the same frequency as the other participants. The only anomaly arises again with respect to the unfamiliar novices, whose low number of overlaps indicates that these participants were being extremely careful.

	Familiar	Unfamiliar
NOV-NOV	23	5
NOV-INT	19	--
NOV-EXP	38	30
INT-INT	--	25
INT-EXP	45	29
EXP-EXP	34	20

Table 4. Bare number of overlaps

	Familiar	Unfamiliar
NOV-NOV	0.40	0.14
NOV-INT	0.31	--
NOV-EXP	0.49	0.52
INT-INT	--	0.40
INT-EXP	0.54	0.40
EXP-EXP	0.44	0.32

Table 5. Number of overlaps per joint project

A central point in the analysis is the following: when the total word count of each text is divided by the number of contributions, this yields the mean length of contribution (in

words) for the text (see figure 3). These follow a downward slope in the data collected. With respect to IM experience, mean length of contribution is highest for novices, lowest for experts. Familiarity with the conversational partner plays a role as well: in 3 of 4 cases where a comparison can be made, familiarity lowers the mean length of contribution.

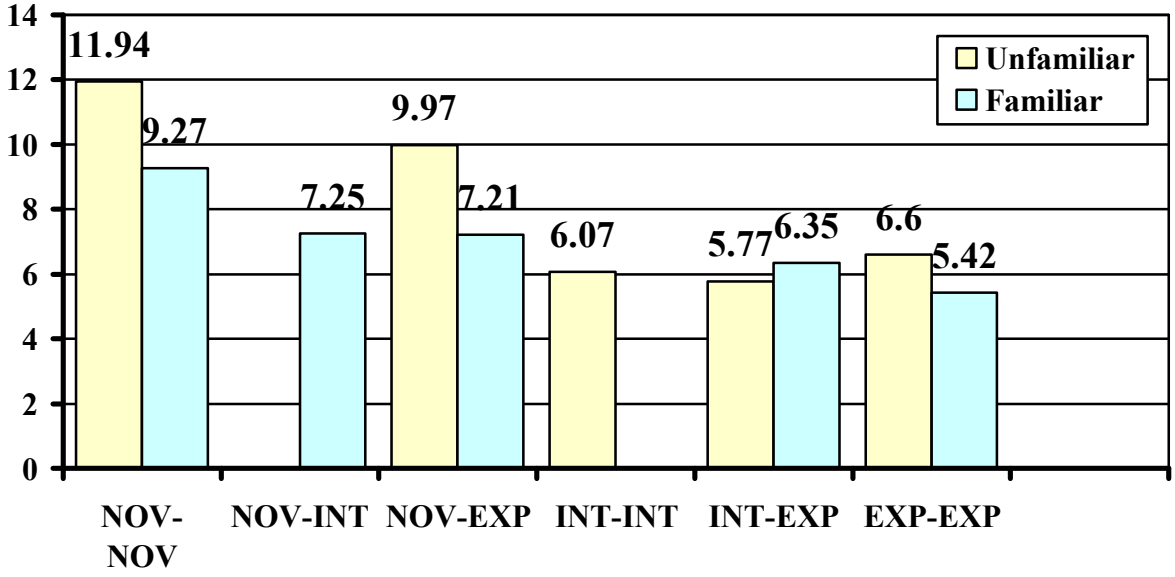

Figure 3. Mean length of contribution (word count/number of contributions)

This essentially suggests that both experience with IM and familiarity with one's conversational partner have an effect on how long or short the messages one sends are. How is this tied to coherence? Sending shorter messages allows a participant to send messages more often. More frequent messages serve as more frequent updates on conversational traffic, and the information that this gives to one's interlocutor assists in determining whose turn it is to make the next contribution.

Out of the three other types of structural information noted for the data collected, increments, pre-increments, and dual-role pairs, only pre-increments displayed a strong pattern of incidence. Pre-increments in these texts primarily serve as placeholders in the discourse, expressing the speaker's intent to produce a longer contribution. While the total number of pre-increments found in the texts was low, they are hardly ever used by novices, and far more frequently by experts, with intermediates falling in the middle (see

figure 4). I argue that the use of pre-increments to mark one's place in the discourse is one of several strategies acquired by frequent users of IM to 'hold the floor', giving the conversational partipant the right-of-way in the following discourse, and marking the utterance as salient.

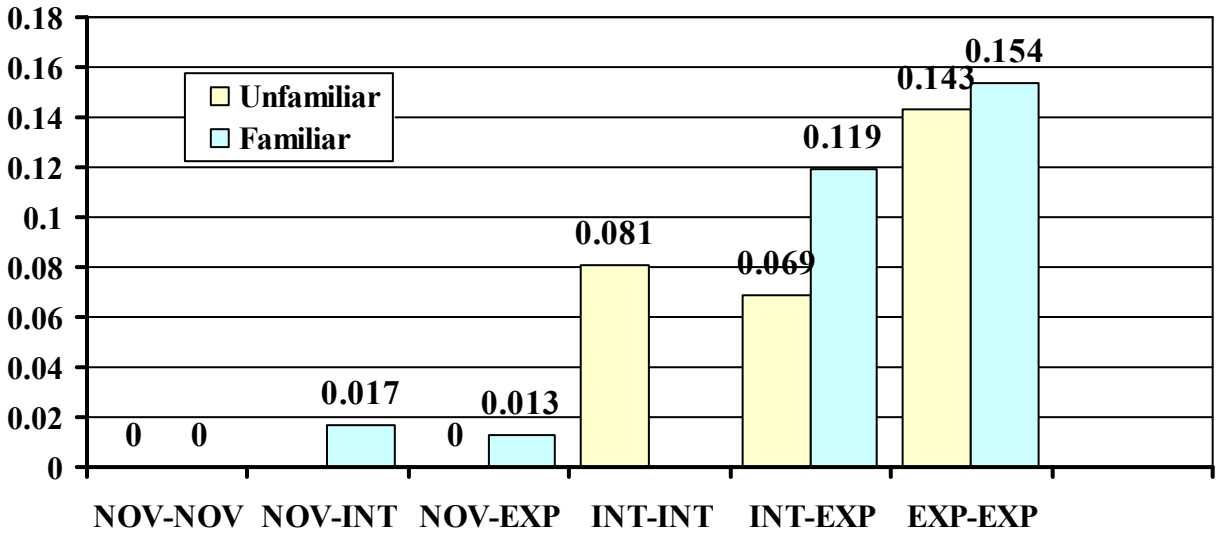

Figure 4. Pre-increments per joint project initiated in each text

Figures 3 and 4 represent the two major strategies found to promote discourse coherence in IM in the quantitative analysis, that is, mean length of contribution, and the use of pre-increments. Expert IM conversants, in general, make shorter contributions (and thus more contributions, as shown in table 2) and adopt the use of pre-increments in order to structure conversation. Additionally, tables 4 and 5 show a surprising result: the incidence of overlaps, hypothesized to reflect conversational incoherence, does not appear to vary significantly over the variables manipulated here. It is possible that more data is necessary in order to better understand the larger picture with regard to the identification or definition of conversational incoherence, but on the basis of the facts about overlap and the strategies identified above, I propose that these strategies do not directly reduce overlap, but instead compensate for the negative effects of overlap on comprehensibility.

5b. *Qualitative analysis*

Three excerpts from the data are presented and discussed here: the first is from the conversation between unfamiliar experts.

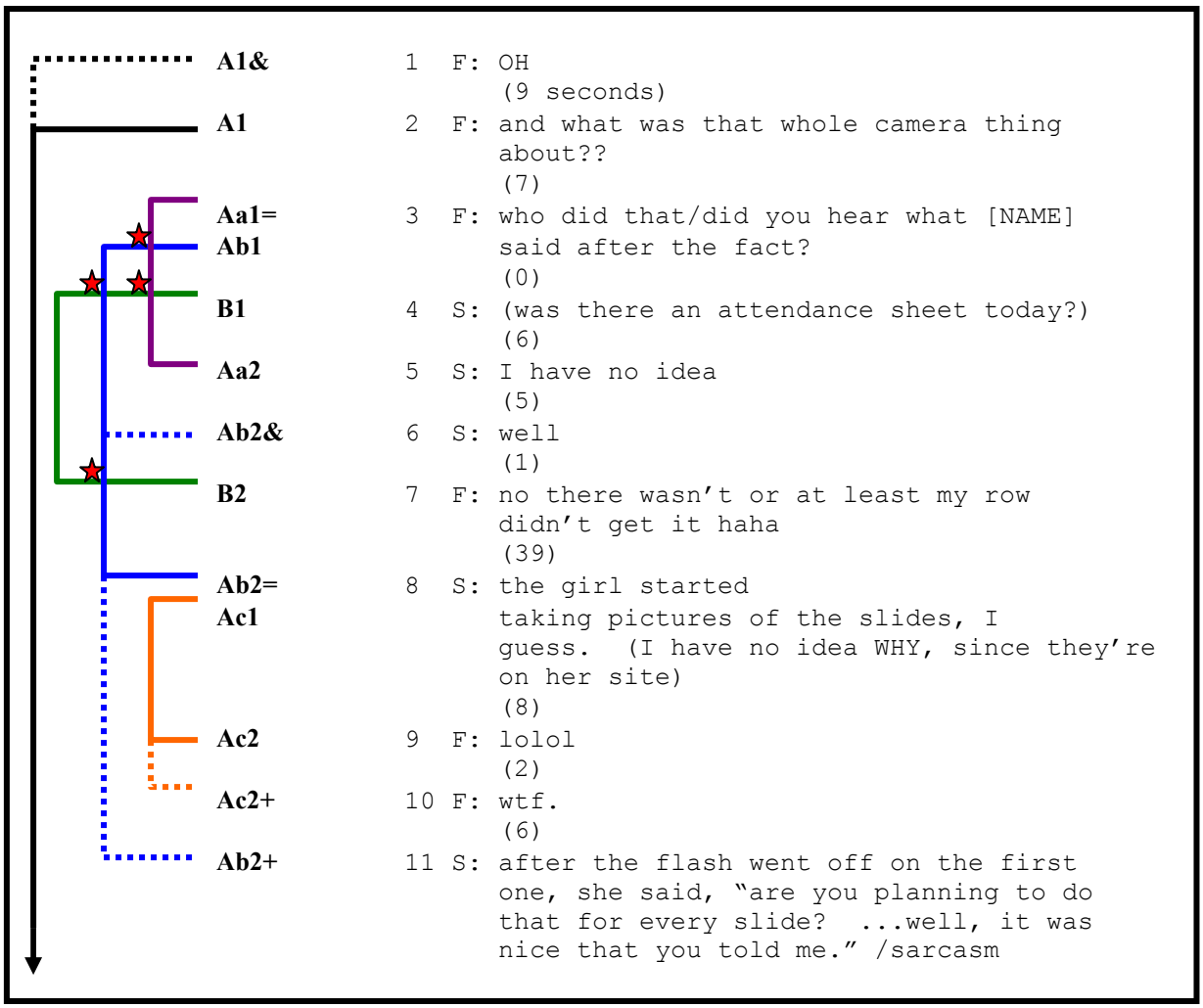

Figure 5. Excerpt from Unfamiliar Expert-Expert conversation

The excerpt in figure 5 from the EXP-EXP B text supports the proposal that expert users effectively compensate for the effects of overlap by using certain strategies. Two instances of pre-increments serve to capture attention and hold the floor (lines 1 and 6, respectively—note that apart from F's contribution on line 7, which certainly wasn't typed in one second, S's *well* holds the floor for a full 39 seconds.). In addition, a new strategy surfaces in this excerpt: the parentheses in line 4 serve to set apart S's contribution from the rest of the conversation. S recognizes F's right to the floor gained in line 1, but has a quick digression to make. In order not to have this digression taken as a response to A2, which is unlikely anyhow, S parenthesizes this request. This is an

important point, and signals an adaptation of the written medium for the structuring of conversation through a modality not available in spoken conversation. Finally, it should be noted that, despite multiple instances of project overlap, there is no evidence of misunderstanding here. This excerpt exemplifies the use of a new strategy and supports the idea that expert users of IM do not use strategies to reduce the incidence of overlap, but rather to maintain comprehensibility in spite of it.

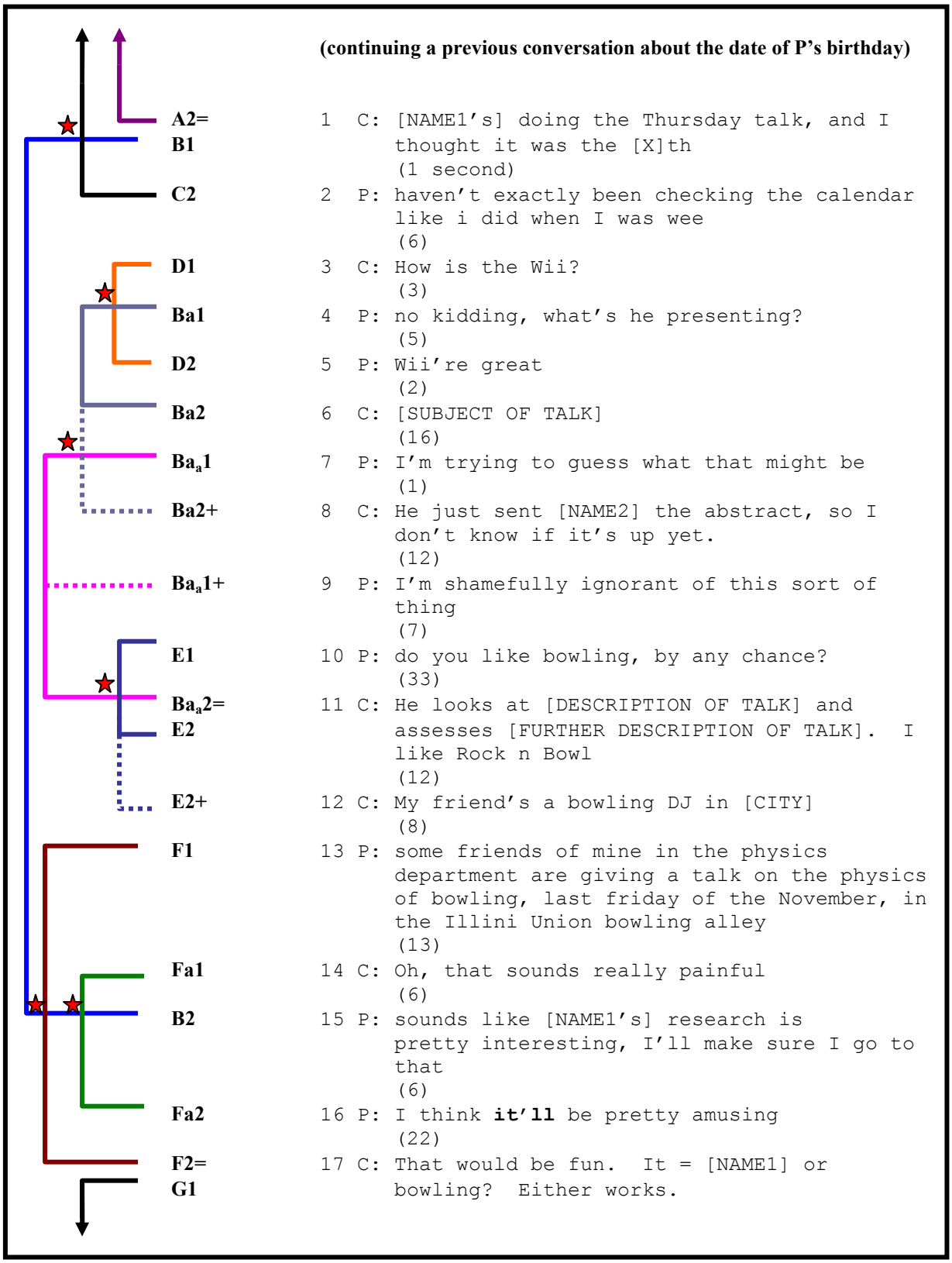

Figure 6. Excerpt from the Familiar Novice-Expert Conversation

This excerpt involves an instance of overt confusion found in the text (line 17), where conversational participant C indicates his/her inability to resolve the reference of *it* in line 16, which is ambiguous to participant C: *it* could refer to *the Thursday talk* in line 1, or the *talk on the physics of bowling* in line 13. Line 16, then, could serve as the second pair part for Fa (as P intended it, clarified later on in the text), or as a continuation of line 15, B2. It is worth noting that the confusion takes place on the part of the novice in the conversation (C), and that a 22 second gap precedes the novice's admission of confusion, which may indicate the novice looking back through the text for a possible anaphor for *it* in line 16. I argue that in this case, the novice, not accustomed to the project overlap prevalent in IM, is unused to treating two consecutive contributions as the second pair parts of two different projects, and for this reason considers the unlikely possibility that participant P would repeat him/herself in a way (*sounds like [...] is pretty interesting / I think it'll be amusing*. Also of interest is the fact that C completes two adjacency pairs in one contribution in line 11, which is a strategy for coherence found in several of the texts. However, this strategy is liable to backfire, as it lengthens response time (note 33 seconds of downtime between lines 10 and 11).

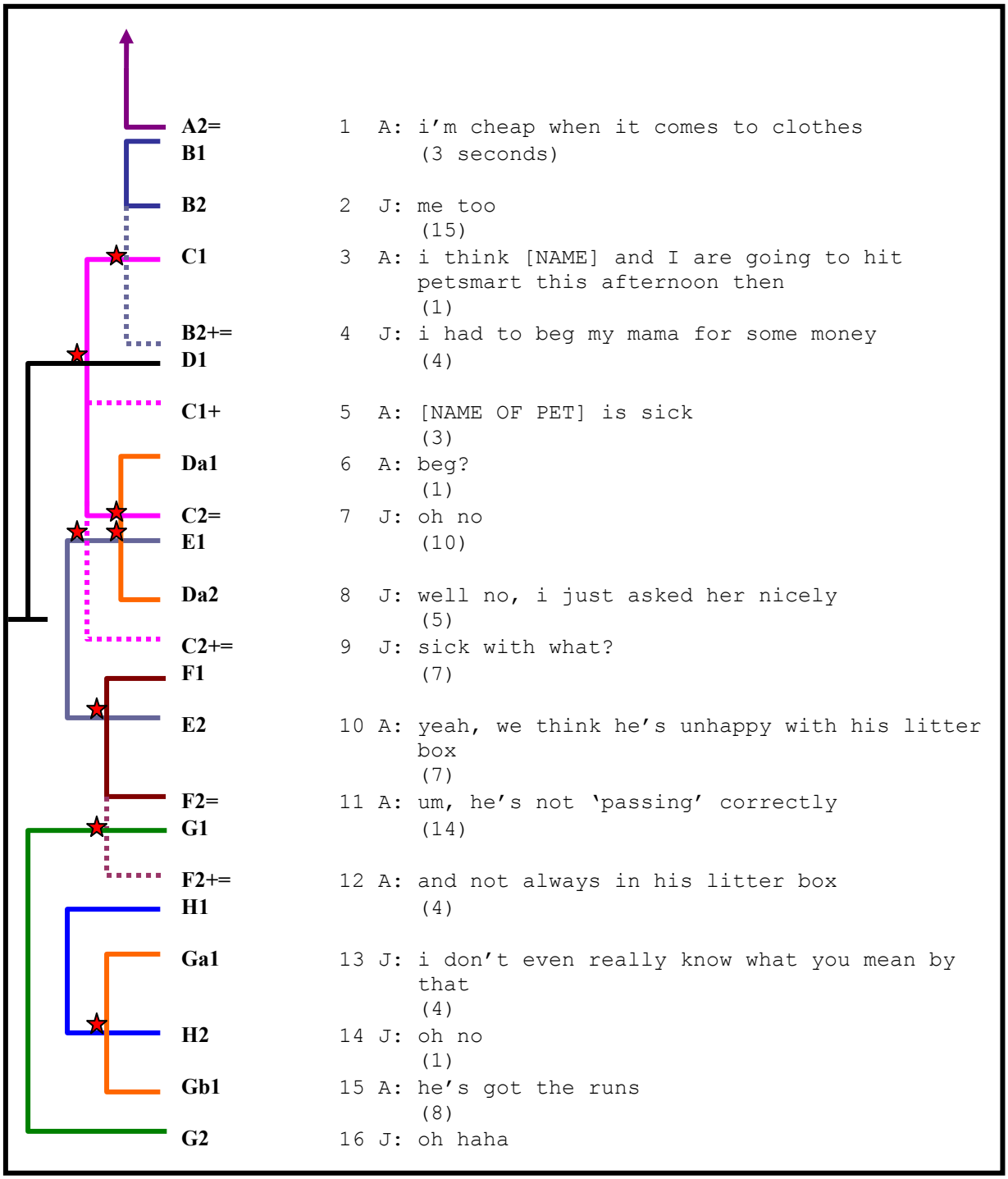

Figure 7. Excerpt from the Familiar Expert-Expert conversation.

The excerpt in figure 7, which contains 8 instances of project overlap, is one of the most incoherent pieces of text collected in the study. Adjacency of relevant contributions is nearly non-existent, but no misunderstandings occur. While J's contribution in line 13 expresses an indirect request for clarification, this is due to A's use of a euphemism to

describe an unpleasant condition in line 11, and does not stem from the conversational structure. Lines 7 and 9-11 exemplify a new strategy: faced with open first pair parts E1 and F1 uttered by J, participant A prefaces each response with a marker making explicit the type of first pair part it is responding to. Compare the actual pairing in (1) below with a possible alternative pairing given in (2):

```
(1)   7     J:    oh no
      10    A:    yeah, [...]

      9     J:    sick with what?
      11    A:    um, [...]


(2)   7     J:    oh no
      11    A:    um, [...]

      9     J:    sick with what?
      11    A:    yeah, [...]
```

The markers *um,* and *yeah,* which preface each second pair part clearly prefer a certain type of first pair part. *um,* is best construed as a hesitation marker indicating that A is searching for the appropriate format for the information s/he is about to provide, thereby indicating that A has understood 9 as a request for information. *yeah,* on the other hand, confirms a previous statement, and prefaces an offer of additional information. These markers relate directly to the notion of conditional relevance, and this contrast indicates an active strategy whereby the respondent exploits canonical adjacency pair types. Even in this drastically incoherent conversation, expert users are able to maintain comprehensibility among their contributions by overtly typing their contributions through the use of discourse markers such as *um,* and *yeah,*.

6. Conclusions

In this study, I investigate the organization of IM conversation, evaluating the notion of conversational incoherence and identifying strategies used to compensate for this incoherence. Herring (1999) claims CMC generally to be incoherent and notes several compensatory strategies used to maintain coherence in various CMC modalities. Few of these strategies, however, are applicable to IM.

The claim of incoherence was checked against a corpus of ten IM conversations of approximately 20 minutes in length, each conversation representing a different combination of two variables: experience with IM and (offline) familiarity with conversational partner. Through the quantitative and qualitative analysis of these data, I have confirmed that in terms of project overlap, structural incoherence occurs in all but the most cautious IM conversations, regardless of the expertise or familiarity of the users. This analysis provides evidence that advanced users of IM do use a greater range of strategies than novice users, and that these strategies can overcome the negative effects of incoherence on comprehensibility. In addition, the study confirms the usefulness of conversation-analytic methodology adapted to the analysis of this medium. By discarding the notion of topic in favor of a methodology based on adjacency pairs and joint projects, this study enjoys a greater degree of rigor in its application to text.

The primary strategies used to overcome the negative effects of incoherence on comprehensibility identified in this analysis are the following:

1) Shortening mean length of contribution in order to more closely approximate real-time interaction

2) The use of pre-increments in order to make new information salient and indicate intent to make a larger contribution (cf. figure 5, line 6)

3) Setting a contribution apart from the main conversation through various means (example given in figure 5, line 4 used parentheses: other examples used colons, capital letters, asterisks, and so forth)

4) Including information from multiple joint projects in a single contribution (cf. figure 6, line 11; this strategy in particular may be misguided due to its conflict with strategy 1).

5) Marking response contributions with a canonical indication (e.g. use of an appropriate discourse marker) of what first pair part type the response is relevant to (cf. figure 7, lines 7, 9-11)

Interestingly, despite the use of these strategies by more advanced users of IM, incoherence as defined by project overlap and lack of adjacency occurs at largely the same rate between novice and experienced users. Taking incoherence to be a purely structural phenomenon which may, but need not, cause incomprehensibility, these strategies do not deal directly with incoherence, but increase comprehensibility directly without reducing project overlap. It is also important to note that strategies 1 and 2, the only ones used commonly enough to be identifiable in the quantitative analysis, approximate certain properties of synchronous face-to-face conversation through speech.

Comprehensibility, which is the concept at stake, does not rely on successful strategy implementation alone. In distinguishing IM from chatroom discourse in the introduction, I noted that IM is generally conducted between real-life friends or long-term online contacts, as opposed to anonymous strangers, which can be the norm in chatroom situations. Good friends and frequent conversants, identified as category A in the present study, have a shared background—a reserve of knowledge about the other and about shared experiences from which to draw. I argue that the quantitative effects of the familiarity variable are a direct result of this background knowledge: between familiar users, not everything has to be spelled out, and understanding without textual coherence is more easily accomplished.

7. Directions for further research

In future experimentation, it is hoped that a more rigorous system of annotation can be devised for application to electronic texts. While the adjacency pair-joint project system adapted from conversation analysis used in this study is a vast improvement over a system based on topic, I believe further refinements will produce a more rigorous, robust system which minimizes the subjectivity of the annotator, testable through the use of inter-annotator agreement. Extensions of this study might focus more heavily on matched pairs of novices, intermediate users, and expert users, as the asymmetric pairings (necessary in this case in order to get a reasonable amount of data) complicated the quantitative analysis. Multiple conversations in each experimental condition would allow

for use of advanced statistical methods and statistical significance tests based on arithmetic means. In addition, conversations between people familiar with one another should be in focus—this is, after all, the norm in instant messaging. Finally, it would be ideal to find computational methods for annotating this sort of text. While conversation-analytic approaches are often too complex to be feasibly accomplished by machine, a stripped-down version such as that presented here (or a further refined version) might not be. The terminology and methodology used in the current project may be considered a tentative step in this direction.

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